Ontario Energy Board | Commission de l'Énergie de l'Ontario

ONTARIO ENERGY BOARD

Transmission System Code

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1. PURPOSE

1.0.1 The purpose of this Transmission System Code (the "Code") is to set out:

(a) the minimum conditions that a transmitter shall meet in designing, constructing, managing, maintaining and operating its transmission system;

(b) the rules governing a transmitter's obligation to connect customers to its transmission system, and to provide transmission service to its customers;

(c) the obligations between a transmitter and its customers and between a transmitter and its neighbouring Ontario transmitters;

(d) the rules governing the economic evaluation of transmission system connections and expansions; and

(e) the minimum standards for facilities connected to a transmission system.

2. DEFINITIONS

In this Code, unless the context otherwise requires:

2.0.1 "Act" means the *Ontario Energy Board Act, 1998*, S.O.1998, c.15, Schedule B, and includes all regulations made thereunder;

2.0.2 "assigned capacity" means, in relation to a customer and a connection facility, the capacity determined in accordance with section 6.2.2;

2.0.3 "available capacity" means, at a given time, the capacity on a connection facility that is not at that time assigned to a customer;

2.0.4 "Board" means the Ontario Energy Board;

2.0.5 "bus" means a common current carrying element which allows the connection of other elements to that common element;

2.0.6 "business day" means any day that is not a Saturday, a Sunday or a legal holiday in the Province of Ontario;

2.0.7 "CIA" means customer impact assessment;

2.0.8 "circuit breaker" means a system element that interrupts the flow of electricity upon receiving a trip signal and includes, where applicable, any associated current transformer and the bus section between the breaker bushing and its current transformer;

2.0.9 "come into service" means, in relation to a facility, the time at which the facility becomes connected to a transmission system and energized following commissioning of the facility;

2.0.10 "connect" means to form a direct physical link between a transmitter's transmission facilities and a customer's facilities or a neighbouring Ontario transmitter's facilities;

2.0.11 "connection agreement" means an agreement entered into by a transmitter and a customer setting out terms and conditions pertaining to connection of the customer's facilities to the transmitter's transmission system and the provision of transmission services in relation to those customer facilities;

2.0.12 "connection facilities" means line connection facilities and transformation connection facilities that connect a transmitter's transmission system with the facilities of another person;

2.0.13 "connection point" means a point of connection between a transmitter's transmission facilities and a customer's facilities;

2.0.14 "connection service" in relation to a transmitter has the meaning given in the transmitter's Rate Order;

2.0.15 "consumer" means a person using, for their own consumption, electricity that they did not generate and whose facilities are connected to a transmission system;

2.0.16 "contracted capacity" means, in relation to a customer and a connection facility, the capacity determined in accordance with section 6.2.3;

2.0.17 "customer" means a generator, consumer, distributor or unlicensed transmitter whose facilities are connected to or are intended to be connected to a transmission system;

2.0.18 "customer facilities" means any and all equipment, elements, and facilities of any kind whatsoever owned by a customer that are relevant to a connection;

2.0.19 "de-energized" means a state at which the stored potential energy of an isolated piece of equipment has been discharged. Electrical equipment is considered de-energized when its electrical energy has been discharged through connection to an effective ground potential. Mechanical equipment is considered de-energized when hazards due to temperature, pressure, chemical substances, gases, radiation, and motion have been minimized or, where practical, eliminated by measures including the following: (i) operation of valves, gates and dampers; (ii) opening of pipes or equipment to the atmosphere; (iii) purging, ventilating, or cooling; (iv) applying brakes and blocking motion; and (v) discharging loaded springs;

2.0.20 "delivery point" has the same meaning as "connection point";

2.0.21 "distribute" with respect to electricity means to convey electricity at voltages of 50 kV or less;

2.0.22 "distributor" means a person who owns or operates a distribution system;

2.0.23 "distribution system" means a system for distributing electricity, and includes any structures, equipment or other things used for that purpose;

2.0.24 "electricity" means electrical energy as measured in kilowatt hours;

2.0.25 "Electricity Act" means the *Electricity Act, 1998,* S.O.1998, c.15, Schedule A, and includes all regulations made thereunder;

2.0.26 "element" means any electrical device that has at least one terminal that is operated at greater than 50 kV and that may be connected to other electrical devices, and is usually associated with a generator, transformer, transmission circuit, circuit breaker, HVDC pole, series or shunt compensating device or bus section;

2.0.27 "emergency" means any abnormal condition that requires automatic or immediate manual action to prevent or limit loss of a licensed transmitter's transmission facilities or loss of the supply of electricity or energy that could adversely affect: (a) the reliability of the licensed transmitter's transmission system, (b) the integrity of customer facilities or of the licensed transmitter's transmission facilities, or (c) public safety, property or the environment;

2.0.28 "facilities" means transmission facilities, a neighbouring Ontario transmitter's facilities or customer facilities, as the context requires, and includes any structures, lines, transformers, breakers, disconnect switches, buses, voltage/current transformers, protection systems, telecommunications systems, cables and any other auxiliary equipment used for the purpose of conveying electricity;

2.0.29 "fault" means an event arising from the failure of facilities, including a short circuit, an open circuit, or an intermittent connection;

2.0.30 "forced outage" means the automatic or manual limitation of service owing to de-rating or limitation of facilities, or the unavailability of facilities as a result of actual or potential failure of those facilities or of any other facilities related to them;

2.0.31 "generator customer" means a customer who owns or operates a generation facility;

2.0.32 "good utility practice" means any of the practices, methods and acts engaged in or approved by a significant portion of the electrical utility industry in North America during the relevant time period, or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good utility practice is not intended to be limited to optimum practices, methods or acts to the exclusion of all others, but rather to include all practices, methods or acts generally accepted in North America;

2.0.33 "harmonic" means a sinusoidal component of a periodic wave or quantity having a frequency that is an integral multiple of the fundamental frequency (for example, a component whose frequency is twice the fundamental frequency is called a second harmonic);

2.0.34 "IMO" means the Independent Electricity Market Operator established by the Electricity Act;

2.0.35 "isolate" means to separate facilities from any source of dynamic energy;

2.0.36 "isolating device" means a device used to separate facilities from any source of dynamic energy;

2.0.37 "licence" means a licence issued under Part V of the Act;

2.0.38 "line connection" means radial lines that do not, under normal operating conditions, connect network stations and whose sole purpose is to serve one or more customers;

2.0.39 "load customer" means a customer who owns or operates a facility other than a generation facility or a transmission system;

2.0.40 "load shedding" means the deliberate disconnection of the load of a customer from a transmission system or a distribution system (either manually or automatically) in response to an emergency in order to maintain the integrity of the transmission system or distribution system and to minimize overall outages to customer facilities;

2.0.41 "maintenance" includes such routine maintenance, troubleshooting, repairs, changes, modifications and other activities as may be required for the safe and efficient operation of facilities;

2.0.42 "Market Rules" means the rules made under section 32 of the Electricity Act;

2.0.43 "neighbouring Ontario transmitter" in relation to a licensed transmitter (the "first transmitter") means another licensed transmitter whose transmission system is located in Ontario and is connected to that of the first transmitter or that seeks to have its transmission system located in Ontario connected to that of the first transmitter, as the context requires;

2.0.44 "network facilities" means those facilities, other than connection facilities, that form part of a transmission system that are shared by all users, comprised of network stations and the transmission lines connecting them;

2.0.45 "NERC" means the North American Electric Reliability Council;

2.0.46 "net book value" means the net book value used by the Board for rate-making purposes;

2.0.47 "outage" means the removal of facilities from service, unavailability for connection of facilities, temporary de-rating, restriction of use or reduction in the performance of facilities for any reason, including to permit the inspection, testing, maintenance or repair of facilities;

2.0.48 "planned outage" means an outage that is planned or intentional and that is scheduled to occur at a pre-selected time, usually for the purpose of permitting construction, preventative maintenance or repair;

2.0.49 "promptly" means performed in a expeditious manner and without undue delay, using due diligence, and with the intent of completing a required act or task as quickly as practicable;

2.0.50 "protection system" means equipment that detects faults or abnormal conditions and takes appropriate corrective action to isolate the faulted element;

2.0.51 "protective relay" means an electrical device that detects a fault or abnormal condition on a transmission system or a distribution system and that is designed to respond to abnormal variations in input conditions and to cause prescribed contact operation or similar abrupt changes in associated electric control circuits which, in turn, if prescribed parameters are met, initiate the operation of a system element (such as a circuit breaker) to disconnect a faulty element (such as a transformer);

2.0.52 "Rate Order" means an order made by the Board under the Act, and in effect at the relevant time, that, among other things, establishes the rates that may be charged by a transmitter for transmission service;

2.0.53 "reliability", in relation to electricity service, means the ability to deliver electricity in accordance with all applicable reliability standards and in the amount desired;

2.0.54 "reliability organization" means NERC, NERC's reliability councils and the IMO;

2.0.55 "reliability standards" means the criteria, standards and requirements relating to reliability set forth in this Code and, where relevant, as established by applicable reliability organizations;

2.0.56 "renewable generation" means generation facilities that generate electricity using one or more of the following sources: wind, sun, biomass, bio-oil, biogas, landfill gas or water;

2.0.57 "single contingency" means a single event, usually involving the loss of one or more elements, that affects a transmission system at least momentarily;

2.0.58 "site" means the land, buildings and other structures on, in or around which facilities are located;

2.0.59 "transformation connection" means transformation facilities, tapped off a transmission system, that step down voltages from transmission levels to distribution levels (i.e. from more than 50 kV to 50 kV or less) in order to supply customer facilities;

2.0.60 "transmission facilities" means facilities owned by a transmitter that form part of or all the transmission system owned by that transmitter;

2.0.61 "transmission service" means a service provided by a transmitter to a customer as specified in the transmitter's Rate Order, and includes Network Service, Line Connection Service, Transformation Connection Service or such other transmission service as may be described in such Rate Order;

2.0.62 "transmission system" means a system for transmitting electricity and includes any structures, equipment or other things used for that purpose;

2.0.63 "transmit" with respect to electricity means to convey electricity at voltages of more than 50 kV;

2.0.64 "transmitter" means a person who owns or operates a transmission system;

2.0.65 "unlicensed transmitter" means a person who owns or operates a transmission system and that is exempt from the requirement to hold a licence under section 57(b) of the Act by virtue of a regulation made under the Act or of the application of section 84 of the Act; and

2.0.66 "work" includes design, installation, construction, commissioning, removal, inspection, testing, undertaking of repairs or undertaking of maintenance.

3. APPLICATION AND INTERPRETATION

3.0.1 All appendices attached to this Code form part of it. Unless otherwise defined in this Code, words and phrases shall have the meaning ascribed to them in the Act or the Electricity Act. Headings are for convenience only and shall not affect the interpretation of this Code. Words importing the singular include the plural and vice versa. Words importing a gender include any gender. Words importing a person include (i) an individual, (ii) a company, sole proprietorship, partnership, trust, joint venture, association, corporation or other private or public body corporate; and (iii) any government, government agency or body, regulatory agency or body or other body politic or collegiate. A reference to a person includes that person's successors and permitted assigns. A reference to a body, whether statutory or not, that ceases to exist or whose functions are transferred to another body is a reference to the body that replaces it or that substantially succeeds to its powers or functions. Where a word or phrase is defined in this Code, the Act or the Electricity Act, other parts of speech and grammatical forms of the word or phrase have a corresponding meaning. A reference to a document (including a statutory instrument) or a provision of a document includes any amendment or supplement to, or any replacement of, that document or that provision. The expression "including" means including without limitation.

3.0.2 A reference in this Code to "dedicated" connection facilities means that such facilities are constructed initially for the sole use of a single customer, but shall not be interpreted to mean that such facilities cannot thereafter be used by any other customer if they are owned by a licensed transmitter at the relevant time.

3.0.3 A reference in this Code to:

(a) "existing load" in relation to a load customer and a connection facility, shall at any point in time be equal to the customer's assigned capacity on that connection facility at that time; and

(b) "new load", in relation to a load customer and a connection facility, shall at any point in time:

i. if the customer has contracted capacity, be equal to the load that exceeds the customer's contracted capacity at that time; or

ii. in any other case, be equal to the load that exceeds the customer's existing load as determined under section 3.0.3(a).

3.0.4 Except when an emergency is anticipated or is occurring, if the time for doing any act or omitting to do any act under this Code expires on a day that is not a business day, the act may be done or may be omitted to be done on the next day that is a business day.

3.0.5 Except to the extent provided in a transmitter's licence, another code issued by the Board or an order of the Board, this Code applies to all licensed transmitters and to all transactions and interactions between a licensed transmitter and its customers and between a licensed transmitter and its neighbouring Ontario transmitters.

3.0.6 A transmitter shall not:

(a) enforce any provision of any agreement that is inconsistent with this Code;

(b) apply any provision of any agreement in a manner that is inconsistent with this Code; or

(c) require another person to enter into an agreement that contains a provision that is inconsistent with this Code or to otherwise agree to terms and conditions that are inconsistent with this Code.

This section 3.0.6 applies to an agreement regardless of whether the agreement was entered into before the day on which this section 3.0.6 comes into force.

3.0.7 To the extent of any inconsistency or conflict between them, a Rate Order and the Affiliate Relationships Code for Electricity Transmitters and Distributors prevail over this Code.

3.0.8 Any matter under this Code requiring a determination by the Board may be determined without a hearing or through an oral, written or electronic hearing, at the Board's discretion.

4. STANDARDS OF BUSINESS PRACTICE AND CONDUCT

4.1 GENERAL REQUIREMENTS

4.1.1 Subject to section 4.1.2, a transmitter shall connect a customer's facilities and shall offer and provide transmission services to a customer subject to that customer entering into or having a connection agreement with the transmitter. Such connection agreement shall be in the form set out in the applicable version of Appendix 1. Where the customer is an unlicensed transmitter, the version of Appendix 1 to be used shall be determined based on the nature of the facility that is connected to the unlicensed transmitter's transmission system. Where both a generation facility and a load facility are connected to the unlicensed transmitter's transmission system, this may require two connection agreements.

4.1.2 A transmitter may not enter into a connection agreement on terms and conditions other than those set forth in the applicable version of Appendix 1 or amend the terms and conditions of a connection agreement relative to the terms and conditions set forth in the applicable version of Appendix 1 except as expressly contemplated in the applicable version of Appendix 1 or with the prior approval of the Board.

4.1.3 Where a transmitter does not have a connection agreement with a customer whose facilities were connected to the transmitter's transmission system on or prior to May 1, 2002, the transmitter shall be permitted to consider that customer's continued acceptance of transmission service as acceptance by that customer of all of the terms and conditions of the connection agreement in the form set out in the version of Appendix 1 that existed on May 1, 2002. In such a case, a reference in this Code to any act that is required to be done or omitted to be done under or in accordance with a connection agreement shall be a

reference to such connection agreement, and any references in that connection agreement to this Code shall be to this Code as it existed at the relevant time.

4.1.4 A transmitter shall ensure that all connections to its transmission system are made by it with due regard for the safety of the transmitter's employees and the public.

4.1.5 A transmitter shall provide customers and any neighbouring Ontario transmitter with all necessary information to enable the transmitter to comply with its obligations under this Code, including the information specified in Appendix 3.

4.1.6 Except as may be required by section 4.1.1 in relation to a customer that is an unlicensed transmitter, a transmitter may not require more than one connection agreement from a customer whose facilities will be or are connected either at a single site or at multiple sites or service territories that are geographically contiguous. A transmitter shall require a separate connection agreement for each facility that a customer may have at geographically noncontiguous sites or service territories.

4.2 TRANSMISSION SERVICE CHARGES

4.2.1 A transmitter shall maintain and make available to all customers a list of its transmission services and the rates or charges approved by the Board for those transmission services.

4.2.2 No transmitter shall charge a customer for any transmission service unless the charge has been approved by the Board.

4.2.3. A transmitter shall not charge a customer for any transmission services in relation to any reduction in that customer's load resulting from renewable embedded generation (determined in accordance with section 11.1), energy conservation, energy efficiency or load management, except in accordance with a Rate Order.

4.2.4 A transmitter shall not impose or enforce a minimum payment obligation on any customer, except in accordance with this Code or a Rate Order.

4.3 FACILITIES STANDARDS

4.3.1 A transmitter shall ensure that its transmission facilities:

(a) meet the requirements of the Ontario Electrical Safety Authority;
(b) conform to relevant industry standards, including those of the Canadian Standards Association, the Institute of Electrical and Electronic Engineers, the American National Standards Institute, and the International Electrotechnical Commission; and
(c) are designed and constructed in accordance with the instruments and standards referred to in section 5.1.2.

4.3.2 The minimum general performance standards to be met by facilities, except facilities deemed compliant under section 4.6.1, are set out in Appendix 2. A transmitter shall provide the appropriate technical parameters to assist a customer in designing its facilities so that they meet those minimum general performance standards.

4.3.3 A transmitter may, at its discretion, participate in the commissioning, inspecting, and testing of customer-owned connection facilities to ensure that facilities connected to its transmission system will not materially reduce or adversely affect the reliability of its transmission system.

4.4 OPERATIONAL STANDARDS AND REPORTING PROTOCOL

4.4.1 A transmitter shall take reasonable steps to ensure that all facilities connected to its transmission system are operated and maintained in accordance with the requirements of this Code and all connection agreements.

4.4.2 Upon request by a customer or a neighbouring Ontario transmitter, a transmitter shall provide the fault levels at all relevant connection points.

4.4.3 A transmitter shall promptly report to a customer or a neighbouring Ontario transmitter any changes in the transmitter's transmission facilities, or in the facilities of another customer or neighbouring Ontario transmitter, that could materially affect the transmission services provided to that customer or neighbouring Ontario transmitter.

4.5 PERFORMANCE STANDARDS

4.5.1 A transmitter shall develop performance standards that apply at the customer delivery point level and that:

(a) reflect typical transmission system configurations that take into account the historical development of the transmitter's transmission system at the customer delivery point level;
(b) reflect historical performance at the customer delivery point level;
(c) are, where applicable, consistent with the comparable performance standards applicable to all delivery points throughout the transmitter's transmission system;
(d) establish acceptable bands of performance at the customer delivery point level for transmission system configurations, geographic area, load, and capacity levels;
(e) establish appropriate triggering events to be used to initiate technical and economic evaluations by the transmitter and its customers regarding performance standards at the customer delivery point level, as well as the circumstances in which any such triggering event will not require the initiation of a technical or economic evaluation;
(f) establish the steps to be taken based on the results of any evaluation that has been so triggered, as well as the circumstances in which such steps need not be taken; and
(g) establish any circumstances in which the performance standards will not apply.

4.5.2 A transmitter shall file the performance standards referred to in section 4.5.1 and any material amendments to those performance standards for the Board's approval. The transmitter may not give effect to such performance standards or any material amendments thereto until the performance standards or amendments have been approved by the Board or amended by the Board under section 4.5.3.

4.5.3 The Board may, on application or on its own motion, amend a transmitter's performance standards and any amendments thereto that have previously been approved by the Board under section 4.5.2 or amended by the Board under this section 4.5.3.

4.5.4 Where a transmitter has filed its performance standards with the Board and such performance standards do not contain all of the material required by section 4.5.1, the transmitter shall revise its performance standards accordingly and shall file the missing material with the Board for approval.

4.5.5 A transmitter shall publish on its website its Board-approved performance standards referred to in section 4.5.1, and shall make those performance standards available upon request.

4.6 COMPLIANCE OF FACILITIES WITH STANDARDS

4.6.1 All facilities that came into service, were procured or were ordered prior to May 1, 2002 are deemed to be in compliance with the performance standards set out in Appendix 2.

4.6.2 A transmitter may require that customer facilities that have been deemed compliant under section 4.6.1 be brought into actual compliance with the performance standards set out in Appendix 2 within a specified time period where the transmitter has identified that:

(a) there is a material deterioration in the reliability of its transmission system resulting from the performance of the deemed compliant facilities;
(b) there are material negative impacts on another customer's or on a neighbouring Ontario transmitter's power quality resulting from the performance of the deemed compliant facilities; or
(c) there is a material increase in capacity or load at the site where the deemed compliant facilities are located.

4.6.3. A transmitter may not act in accordance with section 4.6.2 until the transmitter has developed rules and procedures for requiring customer facilities to be brought into actual compliance and those rules and procedures have been approved by the Board. A transmitter may not give effect to a material amendment to such rules and procedures until the amendment has been approved by the Board or made by the Board under section 4.6.4.

4.6.4. The Board may, on application or on its own motion, amend a transmitter's rules and procedures and any amendments thereto that have been previously approved by the Board under section 4.6.3 or amended by the Board under this section 4.6.4.

4.6.5 If a transmitter's transmission facilities that have been deemed compliant under section 4.6.1 are considered by the transmitter or a customer to be causing any of the effects referred to in sections 4.6.2(a) to 4.6.2(c), the transmitter shall bring those transmission facilities into actual compliance.

4.6.6 A transmitter shall publish on its website its Board-approved rules and procedures referred to in 4.6.3, and shall make those rules and procedures available upon request.

4.7 CONFIDENTIALITY

4.7.1 Subject to section 4.7.2, a transmitter shall not, in performing its obligations or exercising its rights under this Code or under any of the transmitter's procedures referred to in this Code, disclose confidential information relating to a customer or a neighbouring Ontario transmitter to another person without the consent of the customer or neighbouring Ontario transmitter to whom the confidential information relates. Where such consent cannot be obtained, the transmitter may request guidance from the Board.

4.7.2 Nothing in section 4.7.1 shall prevent the disclosure of confidential information by a transmitter:

(a) where required under this Code, the Market Rules or the transmitter's licence;

(b) where required by law or regulatory requirements;

(c) where required by order of a government, government agency or regulatory body or agency having jurisdiction;

(d) if required in connection with legal proceedings, arbitration or any expert determination relating to the subject matter of this Code, or for the purpose of advising the transmitter in relation thereto;

(e) as may be required to enable the transmitter to fulfill its obligations to any reliability organization;

(f) where permitted by the applicable connection agreement or the applicable agreement referred to in section 6.8.1; or

(g) as may be required in an emergency or to prevent an emergency.

5. REQUIREMENTS FOR OPERATIONS AND MAINTENANCE

5.1 DAY-TO-DAY OPERATIONS

5.1.1. A transmitter shall ensure that the operation and maintenance of its transmission facilities are performed only by persons qualified to do so.

5.1.2. A transmitter shall operate and maintain its transmission facilities in compliance with this Code, its licence, its operating agreement with the IMO, the Market Rules, all connection agreements, good utility practice, the standards of all applicable reliability organizations and any applicable law.

5.2 FORCED OUTAGES

5.2.1 When a forced outage of a transmitter's transmission facilities adversely affects any customer facilities, the transmitter shall follow the procedures set out in the relevant sections of the applicable connection agreement.

5.2.2 When a forced outage of a transmitter's transmission facilities adversely affects the facilities of a neighbouring Ontario transmitter, the transmitter shall follow the procedures set out in the relevant sections of the applicable agreement referred to in section 6.8.1.

5.3 SCHEDULING OF PLANNED WORK

5.3.1 A transmitter shall follow the procedures for the scheduling of planned work which are set out in its connection agreements and in any agreements referred to in section 6.8.1.

5.3.2 A transmitter shall coordinate outages arising from planned work scheduled by a customer or a neighbouring Ontario transmitter that directly affect the transmitter's transmission facilities.

5.3.3 A transmitter shall, to the best of its ability, obtain from its customers and from any neighbouring Ontario transmitters their anticipated planned outages for the upcoming year by October 1st of each year.

5.4 EMERGENCY OPERATIONS

5.4.1. During an emergency or in order to prevent or minimize the effects of an emergency, a transmitter may take whatever immediate action it deems necessary to ensure public safety or to safeguard life, property or the environment without first notifying any other person. Without limiting the generality of the foregoing, during an emergency or in order to avoid or minimize the effects of an emergency a transmitter may:

(a) order the switching of equipment;

(b) disconnect the facilities of a customer or of a neighbouring Ontario transmitter; or

(c) require that a customer or a neighbouring Ontario transmitter disconnect its facilities,

in accordance with the applicable connection agreement or agreement referred to in section 6.8.1, as the case may be.

5.4.2 A transmitter that takes action under section 5.4.1 shall promptly report the action taken and the reason for it to all affected customers and neighbouring Ontario transmitters.

5.4.3 A transmitter shall implement load shedding as specified in its connection agreements.

5.4.4 During an emergency or in order to prevent or minimize the effects of an emergency, a transmitter may interrupt supply to a customer or a neighbouring Ontario transmitter to protect the stability, reliability, or integrity of the transmitter's transmission facilities, or to maintain the availability of its transmission facilities. The transmitter shall advise all affected customers and neighbouring Ontario transmitters as soon as possible of the transmitter's transmission system's emergency status and of when to expect the resumption of normal operations and the reconnection of their facilities to the transmission system.

5.4.5 When a transmitter's transmission facilities return to normal operation following an emergency, the transmitter shall notify each affected customer and neighbouring Ontario transmitter that it may reconnect its facilities.

6. CUSTOMER CONNECTIONS

6.1 GENERAL REQUIREMENTS

6.1.1 A transmitter shall design and construct any new or modified connection facilities on a timely basis and in accordance with the connection procedures referred to in section 6.1.3 and all applicable standards and instruments referred to in section 5.1.2.

6.1.2 A transmitter shall ensure that new or modified connections to its transmission system:

(a) do not materially reduce the reliability or performance of its transmission system; and

(b) are constructed with such mitigation measures as may be required so that no new baseline available fault current level referred to in section 6.4.4 exceeds the maximum allowable fault levels set out in Appendix 2 if this would have an adverse effect on any person.

6.1.3 A transmitter shall publish on its website its Board-approved connection procedures for processing requests to connect to its transmission system or to modify existing connections, and shall make those connection procedures available upon request. A transmitter's connection procedures shall be consistent with this Code and shall be consistent with and complementary to the Market Rules and the IMO's market procedures as they relate to connection.

6.1.4 A transmitter's connection procedures referred to in section 6.1.3 shall include the following:

(a) a procedure for determining the total normal supply capacity of a connection facility as required by section 6.2.7;
(b) an available capacity procedure that complies with section 6.2.11;
(c) a security deposit procedure that complies with section 6.3.11;
(d) a customer impact assessment procedure that complies with section 6.4.1;
(e) an economic evaluation procedure that complies with section 6.5.2;
(f) a contestability procedure that complies with section 6.6.2;
(g) a reconnection procedure that complies with section 6.10.3;
(h) a dispute resolution procedure that complies with section 12.1.1;
(h) an obligation on the transmitter to provide a customer with the most recent version of the plans required by section 6.3.6 that cover the applicable portion of its transmission system; and
(j) a schedule of all charges and fees that may be charged by the transmitter and that are not covered by the transmitter's Rate Order.

6.1.5 A transmitter shall file its connection procedures and any material amendments to those procedures for the Board's approval. The transmitter may not give effect to such connection procedures or any material amendments thereto until the connection procedures or amendments have been approved by the Board or amended by the Board under section 6.1.6.

6.1.6 The Board may, on application or on its own motion, amend a transmitter's connection procedures and any amendments thereto that have been previously approved by the Board under section 6.1.5 or amended by the Board under this section 6.1.6.

6.1.7 Where a transmitter has filed its connection procedures with the Board and such connection procedures do not contain all of the material required by section 6.1.4, the transmitter shall revise its connection procedures accordingly and shall file the missing material with the Board for approval.

6.1.8 A transmitter's connection procedures shall not unjustly discriminate among customers or unduly restrict the ability of any person to connect its facilities to the transmitter's transmission system.

6.1.9 A transmitter shall not connect a customer's facilities or any new, modified or replacement customer facilities unless any required connection authorization has been issued by the Ontario Electrical Safety Authority in relation to such facilities.

6.1.10 A transmitter may require, as a condition of connecting a customer's facilities or any new, modified or replacement customer facilities, that the customer provide it with the same technical information provided to the IMO during any connection assessment and facility registration process associated with the customer's facilities or any new, modified or replacement customer facilities. The transmitter shall require that such information be provided in the form outlined in the connection assessments section on the IMO's public website.

6.1.11 A transmitter may require, as a condition of connecting a customer's facilities or any new, modified or replacement customer facilities, that the customer provide it with test certificates certifying that the customer's facilities have passed all relevant tests and comply with all applicable instruments and standards referred to in section 5.1.2, including any certificates of approval, compliance of exemption received from the Ontario Electrical Safety Authority.

6.1.12 A transmitter shall provide to a customer such technical parameters as may be required to assist the customer in ensuring that the design of the customer's facilities or of any new, modified or replacement customer facilities shall be consistent with the requirements applicable to the transmitter's transmission system.

6.1.13 A transmitter shall cooperate with a customer to ensure that modeling data that may be required for the planning, design and operation of connections are complete and accurate. The transmitter shall conduct, or may require that the customer conduct, such tests as may be required where the transmitter believes on reasonable grounds that the accuracy of such data is in question. Where the tests are conducted by the transmitter, the transmitter shall promptly report the results of such tests to the customer and may require that the customer reimburse the transmitter for the costs and expenses reasonably incurred by the transmitter in conducting the tests.

6.2 AVAILABLE CAPACITY

6.2.1 A transmitter shall not assign available capacity on network facilities.

6.2.2 A customer's assigned capacity in relation to a connection facility shall be equal to the aggregate of:

(a) the customer's highest rolling three-month average peak load in the most recent five years, under normal operating conditions; and

(b) any available capacity that has been assigned to the customer and that has not yet been taken up by the customer nor cancelled by the transmitter under section 6.2.19.

If the customer's facility has been connected to the connection facility for a period of less than five years, for purposes of determining the customer's assigned capacity the transmitter shall use the customer's highest rolling three-month average peak load in the year or years during which the customer's facility has been connected to the connection facility.

6.2.3 Where an economic evaluation, including an economic evaluation referred to in section 6.2.24, 6.3.9 or 6.3.17, was conducted by a transmitter for a load customer in relation to a connection facility on the basis of a load forecast, that customer's contracted capacity shall, during the economic evaluation period to which the economic evaluation relates, be equal to the load identified in that load forecast or in any subsequent forecast used for purposes of giving effect to the true-up provisions of section 6.5.

6.2.4 A load customer with contracted capacity on a connection facility shall, in any year, be entitled to capacity in an amount that is equal to:

(a) the amount of capacity for that year as specified in the applicable load forecast referred to in section 6.2.3; or

(b) the customer's assigned capacity for that year;

whichever is greater.

6.2.5 Notwithstanding any assignments of available capacity that a transmitter may make under this section 6.2, the transmitter shall ensure that there is sufficient available capacity on a connection facility to satisfy :

(a) the capacity entitlement of each load customer on that connection facility, determined in accordance with section 6.2.4; and

(b) the assigned capacity and the contracted capacity of all load customers in relation to that connection facility at the relevant time.

The transmitter shall conduct an expansion study where the transmitter considers it necessary to ensure that it can meet this obligation.

6.2.6 A transmitter shall from time to time as required determine the total assigned capacity on a connection facility. For that purpose, the total assigned capacity shall be the aggregate of the assigned capacity of each load customer whose facilities are then served by the connection facility. In making this determination, the transmitter shall take into account the normal size and shape of the load of each load customer served by the connection facility, excluding anomalous situations such as reconfigurations that may be required by the IMO, temporary load transfers, or emergencies.

6.2.7 A transmitter shall from time to time as required determine the available capacity on a connection facility. For that purpose, the available capacity shall be determined by subtracting the total assigned capacity on that connection facility, determined in accordance with section 6.2.6, from the total normal supply capacity for that connection facility. The transmitter shall establish in its connection procedures referred to in section 6.1.4 and implement a procedure to determine the total normal supply capacity of a transformation connection facility and a line connection facility.

6.2.8 Where a load customer requests an assignment of capacity on a connection facility, the transmitter shall determine the available capacity of that connection facility.

6.2.9 A transmitter shall from time to time as required monitor the available capacity on its connection facilities.

6.2.10 Subject to section 6.2.12(e), a transmitter shall assign available capacity on a connection facility on a first-come first-served basis. A transmitter shall not assign capacity to a load customer unless the customer has demonstrated its need for available capacity in accordance with the requirements of the transmitter's available capacity procedure referred to in section 6.2.12(d). This obligation shall apply whether or not implementation of the available capacity procedure is required by section 6.2.11.

6.2.11 A transmitter shall establish an available capacity procedure in its connection procedures referred to in section 6.1.4. The transmitter shall implement the available capacity procedure when:

(a) the available capacity on a connection facility is reduced to 25% of the total normal supply capacity of that connection facility; or

(b) a load customer requests supply capacity on a connection facility that would reduce the available capacity on that connection facility to 25% or less of the total normal supply capacity of that connection facility.

6.2.12 The available capacity procedure referred to in section 6.2.11 shall include provisions that:

(a) specify how load customers will be notified that implementation of the available capacity procedure has been triggered as required by section 6.2.11;

(b) set out how load customers may apply for available capacity in relation to the applicable connection facility;

(c) establish a reasonable amount of time for a load customer to make such an application;

(d) set out how a load customer demonstrates its need for available capacity on the applicable connection facility;

(e) where there is more than one application for available capacity on the applicable connection facility based on demonstrated need, establish that available capacity will be assigned to the relevant load customers in proportion to their respective needs; and

(f) establish the circumstances under which an expansion study will be carried out.

6.2.13 Where a transmitter assigns capacity on a connection facility to itself (in its capacity as a customer) or to a load customer that is an affiliate of the transmitter, the transmitter shall give notice of such assignment to all other customers served by that connection facility regardless of whether such assignment triggers implementation of the available capacity procedure under section 6.2.11.

6.2.14 When a transmitter proposes to carry out an expansion study under section 6.2.5 or 6.2.12(f) in relation to the provision of new connection capacity by means of an increase in the capacity of an existing connection facility or the construction of a new connection facility, the transmitter shall notify all load customers served or expected to be served by the existing or the proposed new connection facility.

6.2.15 Where a new connection facility is proposed under section 6.2.14, the transmitter shall also notify all load customers served by existing connection facilities that surround the proposed new connection facility. Such notice shall advise each load customer that it may apply to the transmitter to reconfigure load representing its assigned capacity or its contracted capacity to the proposed new connection facility. Where a load customer makes such an application, the transmitter shall negotiate in good faith with the customer to determine the terms and conditions that will govern the reconfiguration, which terms and conditions shall be no less favourable to the load customer than would have been the case had the customer continued to be served from the existing connection facilities. Where the transmitter receives applications from load customers in circumstances where the applications cannot all be accommodated by the transmitter, the transmitter shall reconfigure the load of each load customer in proportion to its assigned capacity or contracted capacity.

6.2.16 Upon completion of an expansion study, the transmitter shall advise all affected customers of the available capacity on all relevant existing and new connection facilities before and after the expansion.

6.2.17 Where available capacity is assigned to a load customer in relation to a connection facility and the customer has a connection agreement, the contracted capacity and load shape shall be specified in the connection agreement.

6.2.18. Available capacity that has been assigned to a load customer in relation to a connection facility may not, without the consent of the customer, be reassigned by a transmitter nor be reassigned by the customer except in connection with a change in ownership of the facility to which the assigned capacity relates. A transmitter shall, upon request, reassign assigned capacity as required to reflect such change in ownership.

6.2.19 Subject to section 6.2.20, where a transmitter has assigned available capacity on a connection facility to a load customer, the transmitter shall:

(a) cancel the assignment if that capacity has not been taken up by that customer within one year of the assignment, except where that capacity is included in a load forecast referred to in section 6.2.3;

(b) treat such capacity as available capacity; and

(c) notify all other customers whose facilities are served by that connection facility of the cancellation of the assignment.

The one-year period continues to run regardless of any change in the ownership of the facility to which the assigned capacity relates or of any reassignment of the assigned capacity as a result of that change in ownership.

6.2.20 A customer may request that the transmitter extend the one-year period referred to in section 6.2.19 where circumstances warrant, such as where the customer is constructing new facilities that require more than one year to come into service. A transmitter shall not unreasonably deny such a request. Where the transmitter denies such a request, the customer may apply to the Board for an order requiring the transmitter to extend the one-year period.

6.2.21 Where a transmitter extends the one-year period referred to in section 6.2.19 in relation to itself (in its capacity as a customer) or a load customer that is an affiliate of the transmitter, the transmitter shall give notice of such extension to all other load customers served by that connection facility.

6.2.22 Upon request, a transmitter shall assign available capacity on a transmitter-owned connection facility to serve an existing load customer's new load unless the transmitter can demonstrate that the available capacity will not meet the customer's needs.

6.2.23 When a load customer provides its own connection facility to serve new load, the transmitter shall not assign capacity on the relevant transmitter-owned connection facility to that customer in relation to that new load.

6.2.24 Where a customer has made a capital contribution for the construction of a connection facility, and where that capital contribution includes the cost of capacity on the connection facility not needed by the customer, the transmitter shall provide a refund, calculated in accordance with section 6.2.25, to the customer if that capacity is assigned to another customer within five years of the date on which the connection facility comes into service. The transmitter shall require a financial contribution from the subsequent customer to cover the amount of that refund.

6.2.25 For purposes of sections 6.2.24 and 6.3.17, the transmitter shall determine the amount of the refund to the initial customer and of the financial contribution from the subsequent customer by calculating a revised capital contribution amount using the prescribed economic evaluation methodology set out in section 6.5 and the same inputs as used in the original economic evaluation except for load, which will be based on the actual load of the initial customer up to the time of connection of the subsequent customer and a revised load forecast for the remainder of the economic evaluation period. The revised load forecast will include an updated load forecast of the initial customer plus the load forecast of the subsequent customer. The transmitter will then use the methodology set out in section 6.3.14, 6.3.15 or 6.3.16 to allocate the revised capital contribution amount to the initial and subsequent customers. The refund to the initial customer shall be determined by subtracting the initial customer's allocated share of the revised capital contribution amount from the original capital contribution amount paid by the initial customer.

6.2.26 Subject to section 6.2.27, a transmitter shall advise a customer of the available capacity on a specific connection facility, upon request.

6.2.27 Without limiting the generality of section 4.7.1, in providing information with respect to available capacity to any person, a transmitter shall protect confidential information about any customer. Subject to section 6.2.16, before disclosing the available capacity on a connection facility that serves only one customer, the transmitter shall obtain the consent of that customer. Where such consent cannot be obtained, the transmitter may request guidance from the Board.

6.3 COST RESPONSIBILITY FOR NEW AND MODIFIED CONNECTIONS

6.3.1. Where a load customer elects to be served by transmitter-owned connection facilities, a transmitter shall require a capital contribution from the load customer to cover the cost of a connection facility required to meet the load customer's needs, to the extent that the cost is not recoverable in connection rates revenue. The transmitter shall calculate any capital contribution to be made by the load customer using the economic evaluation methodology set out in section 6.5.

6.3.2 Where a transmitter has to modify a transmitter-owned connection facility to meet a load customer's needs, the transmitter shall require the load customer to make a capital contribution to cover the cost of the modification, to the extent that the cost is not recoverable in connection rates revenue. The transmitter shall calculate any capital contribution to be made by the load customer using the economic evaluation methodology set out in section 6.5.

6.3.3 Except where a transmitter has to modify a transmitter-owned connection facility to meet a generator customer's needs, the transmitter shall require a generator customer to provide its own dedicated connection facilities and any equipment for monitoring and testing that is required by the transmitter to be installed on the customer side of the connection with the transmitter's transmission system.

6.3.4 Where a transmitter has to modify a transmitter-owned connection facility to meet a generator customer's needs, the transmitter shall require the generator customer to make a capital contribution to cover the cost of the modification, calculated in accordance with the economic evaluation methodology set out in section 6.5.

6.3.5 A transmitter shall not require any customer to make a capital contribution for modifications to the transmitter's network facilities that may be required to accommodate a new or modified connection. If exceptional circumstances exist so as to reasonably require a customer to make a capital contribution for network modifications, the transmitter or any other interested person may apply to the Board for direction.

6.3.6 A transmitter shall develop and maintain plans to meet load growth and maintain the reliability and integrity of its transmission system. The transmitter shall not require a customer to make a capital contribution for a connection facility that was otherwise planned by the transmitter, except for advancement costs.

6.3.7 A transmitter shall provide connection facilities that have a capacity sufficient to meet the needs of the applicable customer, subject to facilities standards and good utility practice.

6.3.8 A transmitter shall not require a customer to make a capital contribution for capacity added to a connection facility in anticipation of future load growth not attributable to that customer.

6.3.9 Where a transmitter is, at the time at which it is constructing a connection facility for a customer, aware of another future customer that will need capacity within five years of the construction of the connection facility, the transmitter shall add that capacity to the connection facility at the time of construction, provided that it obtains a security deposit in a form referred to in section 6.3.11 from that future customer to cover the cost of that additional capacity. The amount of the capital contribution to be obtained from the current customer and the amount or value of the security deposit to be collected from the future customer shall be determined using the prescribed economic evaluation methodology set out in section 6.5, the load forecasts of both customers and the methodology for attributing that capital contribution as described in section 6.3.14, 6.3.15 or 6.3.16. At the time of connection of the future customer's facilities, the transmitter shall where required redo the original economic evaluation using the same inputs except for any revised load forecast provided by the future customer. This will determine the amount of capital contribution to be collected from the future customer. Where the security deposit is in the form of cash, the transmitter shall return the security deposit to the future customer at the time of connection of its facilities to the connection facility, together with interest at the rate referred to in section 6.3.11, less the amount of the future customer's capital contribution. Where the security deposit is in a form other than cash,

the transmitter shall return the security deposit to the future customer upon receipt of the customer's capital contribution.

6.3.10 Where a transmitter needs to construct new or modified network or connection facilities as a result of a connection application from a customer, the transmitter may require a reasonable security deposit in a form referred to in section 6.3.11 from the customer, taking into account the size of the new load or generator output, as the case may be. Where the security deposit is in the form of cash, the transmitter shall return the security deposit to the customer, together with interest at the rate referred to in section 6.3.11, less the amount of any capital contribution owed by the customer, once the customer's facilities are connected to the transmitter's transmission facilities. Where the security deposit is in a form other than cash, the transmitter shall return the security deposit to the customer once the customer's facilities are connected to the transmitter's transmission facilities and any capital contribution has been paid.

6.3.11 A transmitter shall establish a security deposit procedure in its connection procedures referred to in section 6.1.4. The security deposit procedure shall include the following:

(a) provisions that allow a customer to provide the security deposit in the form of cash, letter of credit or surety bond, as may be selected by the customer, or such other form as the customer and the transmitter may agree;

(b) provisions stipulating that any interest to be paid by the transmitter upon returning a security deposit that is in the form of cash shall be paid at the following rates:

i. for the period between the date on which the security deposit was provided by the customer and the date on which the security deposit is required to be returned by the transmitter, at the average over the period of the prime lending rate set by the Bank of Canada less two percent; and

ii. for the period after the date on which the security deposit is required to be returned by the transmitter, at the prime lending rate set by the Bank of Canada plus two percent; and

(c) a description of the circumstances under which the transmitter may keep all or part of a security deposit, provided that a transmitter shall not retain a security deposit given in relation to the construction or modification of network facilities unless the Board has first determined that those facilities are stranded .

6.3.12 For a single generator customer, a transmitter shall attribute to that generator customer the cost of any required modification to a transmitter-owned connection facility required to serve the rated peak output of the generation facilities.

6.3.13 For a single load customer, a transmitter shall attribute to that load customer the cost of any new transmitter-owned connection facility or any modification to such connection facility required to serve that part of the customer's new load that exceeds the total normal operating capacity of any connection facility already serving that customer, as reasonably projected by the load forecast provided by the load customer or by such modified load forecast as may be agreed by the load customer and the transmitter.

6.3.14 Where more than one generator customer triggers the need for a modification to a transmitter-owned connection facility, a transmitter shall attribute the cost of the modification to those generator customers in proportion to the rated peak output of their respective generation facilities. In the case of line connection facilities, the transmitter must also consider the relative length of line used by each generator customer when attributing the cost to those generator customers.

6.3.15. Where more than one load customer triggers the need for a new or modified transmitter-owned connection facility, a transmitter shall attribute the cost to those load customers in proportion to their respective noncoincident incremental peak load requirements, as reasonably projected by the load forecasts provided by each such load customer or by such modified load forecast as may be agreed by such load customer and the transmitter. In the case of line connection facilities, the transmitter must also consider the relative length of line used by each load customer when attributing the cost to those load customers.

6.3.16 For a new or modified transmitter-owned connection facility that will serve a mix of load customers and generator customers, a transmitter shall attribute the cost of the new connection facility or modification to the customers that cause the net incremental coincident peak flow on the connection facility that triggered the need for the new or modified connection facility. If and to the extent that the net incremental coincident peak flow is triggered by one or more load customers, the transmitter shall attribute the cost to each load customer in proportion to its noncoincident incremental peak load requirements. If and to the extent that the net incremental coincident peak flow was triggered by one or more generator customers, the transmitter shall attribute the cost to each generator customer in proportion to the rated peak output of its generation facilities.

The transmitter shall also consider the relative length of line used by each load customer and each generator customer when attributing the cost of a new connection facility or modification to those customers.

6.3.17 Where a customer has made a capital contribution for the construction of a connection facility, and where that capital contribution includes the cost of capacity on the connection facility in excess of the customer's needs in order to comply with facilities standards or good utility practice, the transmitter shall provide a refund, calculated in accordance with section 6.2.25, to the customer if that available capacity is assigned to another customer within five years of the date on which the connection facility comes into service. The transmitter shall require a financial contribution from the subsequent customer to cover the amount of that refund.

6.4 CUSTOMER IMPACT ASSESSMENTS

6.4.1 A transmitter shall establish in its connection procedures referred to in section 6.1.4 a customer impact assessment ("CIA") procedure to be used to assess the impact of proposed new or modified connections on existing customers.

6.4.2 A CIA shall indicate existing available fault current levels and any change in those levels expected to be caused by a proposed new or modified connection, for each affected customer.

6.4.3 A transmitter shall carry out a CIA for any proposed new or modified connection.

6.4.4 A transmitter shall use the results of a CIA to provide each customer affected by a proposed new or modified connection with a new baseline available fault current level in order to allow each customer to take, at its own expense, action to upgrade its facilities as may be required to accommodate the new baseline available fault current level up to the maximum allowable fault levels set out in Appendix 2.

6.4.5 A transmitter shall provide a copy of a CIA to each customer whose facilities are located in the study area used for conducting the CIA and to the Ontario Electrical Safety Authority.

6.5 ECONOMIC EVALUATION OF NEW AND MODIFIED CONNECTIONS

Generator customers

6.5.1 Where a transmitter modifies a transmitter-owned connection facility to meet the needs of a generator customer, the transmitter shall require the generator customer to pay the fully allocated cost of the minimum design required to meet the customer's needs. The transmitter shall include the capital cost of equipment installed on transmitter-owned connection facilities by the transmitter for monitoring and testing. If the generator customer elects to have verification costs included in the economic evaluation rather than paying such costs on an "as incurred" basis over time, the transmitter shall also include the present value of the estimated cost of doing periodic verification testing of its monitoring and testing equipment and of similar equipment owned by the generator customer. The transmitter shall not include costs associated with incremental operations and maintenance but shall keep complete and accurate records of all such costs for each new generation facility connection and shall produce those records to the Board on request .

Load customers

6.5.2 A transmitter shall establish in its connection procedures referred to in section 6.1.4 and implement an economic evaluation procedure that sets out how the transmitter will carry out an economic evaluation of a proposed new or modified connection of a load customer to determine what capital contribution is to be made by the load customer. The economic evaluation procedure shall:

(a) establish that the the financial risk associated with a proposed connection of a load customer shall be determined by the transmitter in the manner set out in Appendix 4;

(b) provide that the economic evaluation period will be 5 years for a high risk connection, 10 years for a medium-high risk connection, 15 years for a medium-low risk connection, and 25 years for a low risk connection;

(c) be based on the discounted cash flow calculation set out in Appendix 5 using the forecast connection rates revenue from the connection facilities and the fully allocated capital cost, operating and maintenance cost and administrative cost of the minimum design required to meet the customer's needs. The costs shall include the transmitter's cost of transmitter-owned equipment for monitoring and

testing installed on connection facilities on either side of the connection point, and the cost of carrying out verification testing on that equipment;

(d) establish that the cost used in the economic evaluation is limited to the advancement costs where the transmitter had planned a new or modified connection facility and moves the planned date forward to accommodate a customer;

(e) use a discount rate that is based on the transmitter's current deemed debt-to-equity ratio, debt and preference share costs and Board-approved rate of return on equity;

(f) require that discounting reflect the true timing of expenditures so that up-front capital expenditures are treated as occurring at the beginning of the first year of operation, and future capital expenditures, annual connection rates revenue and average operation and maintenance costs will be treated as occurring at the mid-point of the year in which they occur;

(g) take into account all relevant tax amounts, adjusted by any applicable capital cost allowance;

(h) exclude network facility costs and network rates revenue;

(i) exclude historic revenues and sunk costs;

(j) establish that the relevant connection rates revenue shall be the revenue derived from that part of the load customer's new load that exceeds the total normal operating capacity of any connection facility already serving that customer and which will be served by a new or modified connection facility;

(k) require that the customer provide its load shape in such form and detail as the transmitter may reasonably require; and

(l) provide for separate economic evaluations for transformation connection facilities and line connection facilities.

Economic evaluation true-up calculations for load customers

6.5.3 For new or modified connection facilities that come into service after June 8, 2004, a transmitter shall carry out a true-up calculation, based on actual customer load, at the following true-up points:

(a) for high risk connections, at the end of each year of operation, for five years;

(b) for medium-high risk and medium-low risk connections, at the end of each of the third, fifth and tenth year of operation; and

(c) for low risk connections, at the end of each of the fifth and tenth year of operation, and at the end of the fifteenth year of operation if actual load is 20 percent higher or lower than the initial load forecast at the end of the tenth year of operation.

6.5.4 Subject to sections 6.5.8, 6.5.9 and 6.5.10, for the true-up calculation, a transmitter shall use the same methodology used to carry out the initial economic evaluation, and the same inputs except for load, which will be based on the actual load up to the true-up point and an updated load forecast for the remainder of the economic evaluation period used.

6.5.5 Subject to sections 6.5.8, 6.5.9 and 6.5.10, before carrying out a true-up calculation for a load customer who did not make an initial capital contribution, a transmitter shall adjust the initial load forecast used in the initial economic evaluation to the point where the present value of connection rates revenue equals the present value of costs.

6.5.6 Where a true-up calculation shows that a load customer's actual load and updated load forecast is lower than the load in the initial load forecast, and does not generate the initial forecast connection rates revenue, a transmitter shall require the load customer to make a payment to make up the shortfall, adjusted appropriately to reflect the time value of money.

6.5.7 Where a true-up calculation shows that a load customer's actual load and updated load forecast is higher than the load in the initial load forecast, and generates more than the initial forecast connection rates revenue, the transmitter shall post the excess revenue as a credit to the customer in a notional account. The transmitter shall apply this credit against any shortfall in subsequent true-up calculations. The transmitter shall rebate to the load customer any credit balance that remains when the last true-up calculation is carried out, adjusted appropriately to reflect the time value of money. The rebate shall not exceed any capital contribution, adjusted to reflect the time value of money, previously paid by the load customer.

6.5.8 When carrying out a true-up calculation for a distributor, a transmitter:

(a) shall add to the actual load the amount of any embedded generation (determined in accordance with section 11.1) that was installed during the true-up period; and

(b) shall not reduce the updated load forecast as a result of any embedded generation (determined in accordance with section 11.1) that was installed during the true-up period.

6.5.9. When carrying out a true-up calculation for a load customer other than a distributor, a transmitter:

(a) shall add to the actual load the amount of any embedded generation (determined in accordance with section 11.1) of 1 MW or less per unit, or any embedded renewable generation of 2 MW or less per unit, that was installed during the true-up period; and

(b) shall not reduce the updated load forecast as a result of any embedded generation (determined in accordance with section 11.1) of 1MW or less per unit, or any embedded renewable generation of 2 MW or less per unit, that was installed during the true-up period.

6.5.10 When carrying out a true-up calculation for any load customer, a transmitter:

(a) shall add to the actual load the amount of any demonstrable load reduction due to energy conservation, energy efficiency, load management or renewable energy activities that occurred during the true-up period; and

(b) shall not reduce the updated load forecast as a result of any demonstrable load reduction due to energy conservation, energy efficiency, load management or renewable energy activities that occurred during the true-up period.

6.5.11 Where a load customer voluntarily and permanently disconnects its facilities from a transmitter's facilities prior to the last true-up point referred to in section 6.5.3, the transmitter shall at the time of disconnection carry out a final true-up calculation in accordance with the rules set out in sections 6.5.4, 6.5.5, 6.5.8 and 6.5.9. Where the true-up calculation shows that the load customer's load to the date of disconnection has not generated the initial forecast connection rates revenue, the transmitter shall require the load customer to make a payment to make up the shortfall, adjusted appropriately to reflect the time value of money. Where a true-up calculation shows that the load customer's load to the date of disconnection has generated more than the initial forecast connection rates revenue, the transmitter shall rebate to the load customer any excess, adjusted appropriately to reflect the time value of money. The rebate shall not exceed

any capital contribution, adjusted to reflect the time value of money, previously paid by the load customer.

6.6 CONTESTABILITY

6.6.1 Where a load customer requires new dedicated connection facilities, a transmitter shall allow the load customer to elect either to provide its own connection facilities or to require the transmitter to provide them. Where the load customer elects to require the transmitter to provide the connection facilities, the transmitter shall also allow the load customer to elect to have any associated contestable construction or design work (as identified in the transmitter's contestability procedure referred to in section 6.6.2) carried out by a party other than the transmitter.

6.6.2 A transmitter shall establish in its connection procedures referred to in section 6.1.4 and implement a contestability procedure. The contestability procedure shall establish:

(a) what work can be done by the transmitter only, on its own facilities, including conceptual design (uncontestable work), and what other connection facility construction and design work may, at a load customer's option, be done by either the transmitter or the load customer;

(b) the obligation of the transmitter to provide, at no cost:

  (i) a description of the contestable work and uncontestable work;

  (ii) a description of the labour and materials for each of the contestable work and the uncontestable work;

  (iii) the capital cost for each of the contestable work and the uncontestable work, broken down into labour (including design, engineering and construction), materials, equipment, direct overhead (including administration) and indirect overhead costs;

  (iv) the calculation used to determine any capital contribution to be paid by the load customer if the transmitter constructs the connection facilities, even if no capital contribution is required. This calculation must include all of the assumptions and inputs used to produce the economic evaluation as described in 6.5 ; and

  (v) the information set out in Appendix 3, and the technical standards and specifications applicable to the contestable work, in sufficient detail to allow the load customer to design and construct connection facilities that

will meet the requirements applicable to the transmitter's transmission system;

and to provide, at cost, any revisions to this information required due to changes in the load customer's plans;

(c) the right of a load customer to choose to carry out any part of the contestable work or to require the transmitter to do it;

(e) where a load customer elects to carry out contestable work, the obligation of the load customer to complete that contestable work in accordance with the transmitter's conceptual design and technical standards and specifications and to pay any Board-approved fees for inspection, testing and commissioning by the transmitter;

(f) the right of a load customer to transfer the dedicated connection facilities it constructs to the transmitter and the obligation of a load customer to transfer non-dedicated connection facilities that it constructs to the transmitter;

(g) where a load customer proposes or is obliged to transfer the connection facilities it constructs to the transmitter, the obligation of the transmitter to provide, upon request and at cost, engineering design in sufficient detail to allow the load customer to carry out the contestable work and meet the specific connection facility design and performance requirements of the transmitter;

(h) the obligation of the transmitter to pay a transfer price that is the lower of the cost to the load customer or the transmitter's reasonable cost to do the same work, for any connection facility a load customer constructs and opts or is required to transfer to the transmitter; and

(i) where the transmitter pays a transfer price for a connection facility constructed by a load customer, the obligation of the transmitter to make any adjustment required to reflect that transfer price in any capital contribution that is to be paid by the load customer.

6.6.3 A transmitter shall provide a copy of its contestability procedure to any load customer requiring new connection facilities.

6.7 REPLACEMENT, RELOCATION AND BYPASS OF EXISTING FACILITIES

6.7.1 A transmitter shall notify each customer that will be affected by the transmitter's plans to retire a connection facility, at least five years in advance of the effective date of the retirement. The transmitter shall give each affected customer the option of:

(a) providing its own replacement connection facility;
(b) connecting its facilities to the connection facility of another person; or
(c) requiring the transmitter to provide a replacement connection facility.

6.7.2 Where a transmitter's transmission facility is retired, the transmitter shall not recover:

(a) a capital contribution from a customer to replace that transmission facility; or
(b) any bypass compensation from the load customer in the event that the load customer transfers load to its own connection facility or to the connection facility of another person.

6.7.3 Where a customer requests the relocation of a transmitter's transmission facility, the transmitter shall recover from that customer the cost of relocating that transmission facility.

6.7.4 Where a transmitter's transmission facility is relocated in the absence of a customer request, the transmitter shall bear the cost of relocating that transmission facility.

6.7.5 When a load customer provides its own connection facility to serve new load or transfers new load to the connection facility of another person, the transmitter shall not require bypass compensation from that customer.

6.7.6 Subject to sections 6.7.2, 6.7.7 and 6.7.8, for all or a portion of existing load a load customer may bypass a transmitter-owned connection facility with its own connection facility or the connection facility of another person , provided that the load customer compensates the transmitter. The transmitter shall calculate bypass compensation by first multiplying the net book value of the bypassed connection facility, including a salvage credit and reasonable removal and environmental remediation costs, if applicable, by the bypassed capacity on the relevant connection facility. The transmitter shall then divide the resulting figure by the total normal supply capacity of the bypassed connection facility. For purposes of this calculation:

(a) the bypassed capacity on the relevant connection facility shall be equal to the difference between the customer's existing load on that connection facility at the time of bypass and the customer's average monthly peak load in the three-month period following the date on which bypass occurred; and

(b) the normal supply capacity of the bypassed connection facility shall be determined by the transmitter in accordance with the Board-approved procedure referred to in section 6.2.7.

6.7.7 Where an economic evaluation, including an economic evaluation referred to in section 6.2.24, 6.3.9 or 6.3.17, was conducted by a transmitter for a load customer in relation to a connection facility on the basis of a load forecast, a transmitter shall not, during the economic evaluation period to which the economic evaluation relates, require bypass compensation from a customer under section 6.7.6 in relation to any load that represents that customer's contracted capacity.

6.7.8 A transmitter should avoid overloading a connection facility above its total normal supply capacity. Where a connection facility has been overloaded, and a customer transfers the overload to its own connection facility or to the connection facility of another person, the transmitter shall not require bypass compensation from the customer.

6.7.9 A transmitter shall promptly notify the Board upon becoming aware that a load customer that is a distributor intends to bypass a transmitter-owned connection facility with its own connection facility or the connection facility of another person.

6.8 OBLIGATIONS BETWEEN NEIGHOURING ONTARIO TRANSMITTERS

6.8.1 A transmitter shall enter into an agreement with each neighbouring Ontario transmitter. The agreement shall describe the facilities connecting the two transmission systems and shall set out the respective obligations of the parties in relation to:

(a) transmission system expansion;
(b) operational requirements and authorities;
(c) protections;
(d) emergency preparedness and emergency operations;
(e) outage co-ordination;
(f) forced outages;
(j) new or modified transmission facilities;

(h) the information to be exchanged between the parties;
(i) the protection of confidential information; and
(j) a dispute resolution process that satisfies the requirements set out in section 12.1.2.

6.8.2 An agreement referred to in section 6.8.1 shall contain such other provisions as may be required to enable a transmitter to comply with its obligations under this Code relative to neighbouring Ontario transmitters and to the reliability and integrity of its transmission system.

6.9 RECORD KEEPING AND REPORTING REQUIREMENTS

6.9.1 A transmitter shall maintain complete and accurate records of all economic evaluations required to be carried out under this Code, including the economic evaluations referred to in sections 6.2.24, 6.3.9 and 6.3.17. Each record must show the details of the economic evaluation, including the economic evaluation period, the load forecast, the project capital costs, the ongoing operation and maintenance costs, and the project after tax incremental cost of capital, and must include the justification for all of the study parameters.

6.9.2 A transmitter shall file the records referred to in section 6.9.1 with the Board on request.

6.10 RECONNECTION

6.10.1 A transmitter shall investigate and determine the cause of any reported shutdown of a customer's facilities, regardless of the reason for that shutdown, using available evidence including input from the customer's staff.

6.10.2 Once a transmitter is satisfied that reconnection of a customer's facilities will not cause any adverse effects on the transmitter's transmission system, it shall immediately advise the customer when reconnection can take place. Reconnection to the transmitter's transmission facilities shall not take place until authorized by the transmitter.

6.10.3 A transmitter shall establish a reconnection procedure in its connection procedures referred to in section 6.1.4 setting out the steps to be taken by the transmitter when a customer whose facilities have been disconnected asks to be reconnected. The procedure shall also provide for notice to be given to the customer, setting out all steps to be taken by the customer and the transmitter, any system studies that will be carried out by the

transmitter, any cost to be borne by the customer, and the duration of the reconnection process.

6.10.4 A transmitter shall not carry out a system study in relation to a proposed reconnection unless it can demonstrate that the system study is necessary to ensure system integrity or is required by the IMO.

7. COMPLIANCE, INSPECTION, TESTING AND MONITORING

7.1 REQUIREMENTS

7.1.1 A transmitter shall inspect, test and monitor its transmission facilities to ensure continued compliance with all applicable standards and instruments referred to in section 5.1.2.

7.1.2 A transmitter shall maintain complete and accurate records of the results of all performance inspecting, testing and monitoring that it conducts in fulfilment of its obligations under this Code. The transmitter shall keep these records for a minimum of seven years and shall make them available to the Board on request.

8. GENERAL TECHNICAL REQUIREMENTS

8.1 GUIDELINES OF RELIABILITY ORGANIZATIONS

8.1.1 A transmitter shall ensure compliance with the standards of all applicable reliability organizations.

8.1.2 A transmitter shall provide to a customer, upon request, the name and address of a contact person for each applicable reliability organization.

8.2 PROTECTION AND CONTROL

8.2.1 A transmitter shall install and maintain protection systems that are capable of minimizing the severity and extent of disturbances to the transmission system while themselves experiencing a first-order single contingency such as the failure of a relay protection system to operate or the failure of a breaker to trip. In particular:

(a) the facilities designated by the transmitter or the IMO as essential to system reliability and security shall be protected by two protection systems. Each system shall be independently capable of detecting and isolating all faults on those facilities. Those facilities shall also have breaker failure protection, but breaker failure protection need not be duplicated. Both protection systems shall initiate breaker failure protection;

(b) to reduce the risk of both protection systems being disabled simultaneously by a single contingency, the two protection systems shall not use common components;

(c) the use of two identical protection systems should be avoided to reduce the risk of simultaneous failure of both systems due to design deficiencies or facilities problems;

(d) the protection systems shall be designed to isolate only the faulted facilities. For faults outside the protected zone, each protection system shall be designed either not to operate or to operate selectively in coordination with other protection systems;

(e) protection settings at tapped transformer stations owned by the transmitter, for protection of system elements affected by conditions on the transmission system, shall be coordinated with other system elements of the transmission system;

(f) protection systems shall not operate to trip for stable power swings following contingencies that are judged by protection system designers as not harmful to the transmission system or its customers;

(g) the components and software used in all protection systems shall be of proven quality for effective utility application and follow good utility practice;

(h) critical features associated with the operability of protection systems and the high voltage interrupting device (HVI) shall be annunciated or monitored;

(i) the design of protection systems shall facilitate periodic testing and maintenance. Test facilities and procedures shall not compromise the independence of the redundant protection systems. Test switches shall be used to eliminate the need to disconnect wires during testing;

(j) the two protection systems shall be supplied from separate secondary windings on one voltage transformer or potential device and from separate current transformer secondary windings (using two current transformers - one current transformer for each protection system);

(k) separately fused and monitored DC sources shall be used with the two protection systems. For all generating facilities connected to the transmission system, two separate DC station battery banks shall be required to provide the required degree of reliability; and

(l) protection system circuitry and physical arrangements shall be designed to minimize the possibility of incorrect operations from personnel error;

8.2.2 A transmitter shall follow the specific protection and control practices and facilities requirements which are set out in Schedule G of the applicable version of Appendix 1.

8.2.3 A transmitter should apply protection systems using the typical tripping matrix for transmission system protection shown in Exhibit E.2, Schedule E of the applicable version of Appendix 1.

8.3 INSULATION COORDINATION

8.3.1 A transmitter shall ensure that its facilities are protected against lightning and switching surges. This shall include station shielding against direct lightning strokes, surge protection on all wound devices, and cable/overhead interfaces.

8.3.2 A tap connected to a shielded transmission circuit shall also be shielded.

8.4 GROUNDING

8.4.1. A transmitter shall ensure that grounding installations are capable of carrying the maximum foreseeable fault current, for the duration of such fault currents, without risking safety to personnel that may be present on site when a fault, damage to facilities, or interference with the operation of the transmission system occurs.

8.4.2 A transmitter shall ensure that each of its tapped transformer stations and network transformation and switching stations has a ground grid to which all metallic structures, metallic equipment and non-energized metallic equipment are solidly connected. The size, type and requirements for the ground grid are site-specific, depending on such factors as soil conditions, station size, and short-circuit level.

9. TECHNICAL REQUIREMENTS FOR TAPPED TRANSFORMER STATIONS SUPPLYING LOAD

9.1 SUPPLY CONSIDERATIONS

9.1.1 A transmitter shall ensure that tapped transformer stations, excluding those that are deemed compliant under section 4.6 of this Code, have adequate on-load tap-changer or other voltage regulating facilities to operate continuously within normal variations on the transmission system as set out in the Market Rules and to operate in emergencies with a further transmission system voltage variation of ± six percent.

9.1.2 The neutrals of the power transformer primary windings at transmission system tapped stations are normally not grounded.

9.2 PROTECTION REQUIREMENTS

9.2.1 The typical technical requirements for a transmitter's tapped transformer stations protection are set out in Exhibit E.1, Schedule E of the applicable version of Appendix 1, and Exhibits F.1 and F.2, Schedule F of version A of Appendix 1.

9.2.2 Line protections are required when transformers connected to separate supply circuits are operated in parallel on the low-voltage side, or if a large synchronous infeed exists at the low-voltage bus.

9.2.3 Directional current sensing relays may be required to detect infeed into faults within the transmission system and to isolate a tapped transformer station's contribution to the fault. Distance or impedance (21) relays as specified in Exhibit F.2, Schedule F of version A of Appendix 1, may serve this need.

9.2.4 If the tapped transformer is connected ungrounded wye or delta on the primary, then ground under-voltage (64-27) and ground over-voltage (64-59) protections as shown in Exhibit F.2, Schedule F of version A of Appendix 1 are required to detect ground faults.

9.2.5 Where the tapped transformer is connected wye-grounded on the primary (Yg/D or Yg/Yg), a ground over-current relay (64) as indicated in Exhibit F.2, Schedule F of version A of Appendix 1, connected in the transformer neutral, may be used for detection.

9.2.6 Where remote/transfer trip circuits are used for tapped transformer faults to trip the transmitter's line breakers at the terminal stations, the tapped transformer shall be equipped with a motor-operated transformer disconnect switch at that station to provide a point of separation from the transmission system. Energization of remote/transfer trip and opening of the disconnect switch (89) shall be initiated simultaneously from the protection circuits. Full opening of the disconnect switch shall block sending of remote trip.

10. PROTECTION SYSTEM REQUIREMENTS

10.1 TELECOMMUNICATIONS

10.1.1 A transmitter shall ensure that telecommunication facilities used for protection purposes have a level of reliability consistent with the required performance of the protection system.

10.1.2 A transmitter shall specify to all customers telecommunication channel media and protective systems.

10.1.3 A transmitter shall ensure that telecommunication circuits used for the protection and control of the transmission system are dedicated to that purpose.

10.1.4 Where each of the dual protections protecting the same system element requires communication channels, a transmitter shall ensure that the equipment and channel for each protection is separated physically and designed to minimize the risk that both protections might be disabled simultaneously by a single contingency.

10.1.5 A transmitter shall ensure that telecommunication systems are:

(a) designed to prevent unwanted operations such as those caused by equipment or personnel,

(b) powered by the station's batteries or other sources independent from the power system, and

(c) monitored in order to assess equipment and channel readiness.

10.1.6 Major disturbances caused by telecommunication failures shall have annual frequency of less than 0.002 per year from the dependability aspect and less than 0.002 per year from the security aspect.

10.1.7 A transmitter shall ensure that telecommunication protection for a single transmission system circuit shall be unavailable for no more than 42 minutes per year, and for two circuits, no more than four minutes per year.

10.1.8 A transmitter shall ensure that the telecommunication false-trip rate used as part of a protection system for a single transmission system circuit is no more than 0.1 false trips per year, and for two circuits, no more than 0.001 false trips per year.

10.1.9 A transmitter shall ensure that total transmission system circuit trips coincident with telecommunications failure are no more than 0.001 per year.

10.2 TEST SCHEDULE FOR RELAYING COMMUNICATION CHANNELS

10.2.1 A transmitter shall test communication channels associated with protective relaying at periodic intervals to verify that the channels are operational and that their characteristics are within specific tolerances. Testing should include signal adequacy tests and channel performance tests.

10.2.2 Signal adequacy testing for unmonitored channels shall be done at one month intervals. Signal adequacy testing for monitored channels shall be done at twelve month intervals.

10.2.3 Channel performance testing on leased communication circuits shall be conducted at 24 month intervals, while intervals for testing power line carrier equipment shall be equipment-specific.

10.3 VERIFICATION AND MAINTENANCE PRACTICES

10.3.1 A transmitter shall use the maximum verification intervals established by reliability organizations and in accordance with applicable reliability standards: (a) four years for most 115kV elements, most transformer stations, and certain 230kV elements: (b) two years for all other high- voltage elements. All newly commissioned protection systems shall be verified within six months of the initial in-service date of the system.

10.3.2 Routine verification shall ensure with reasonable certainty that the protection systems respond correctly to fault conditions.

10.3.3 A transmitter shall use an electrically initiated simulated-fault clearing check to verify new protection systems, after any wiring or component changes are made to an existing protection system, and for the routine verification of a protection system.

10.4 FUNCTIONAL TESTS AND PERIODIC VERIFICATION

10.4.1 For direct current circuitry checks, a transmitter shall thoroughly check the logic of the auxiliary circuitry with the direct current applied and the initiating devices suitably energized to initiate the process. When primary relays are the initiating device, the initiation shall be achieved by secondary injection of appropriate electrical quantities to the measuring elements. In cases where the sequence of operation is critical, monitoring by a portable sequence-of-events recorder may be required for proper analysis. Operation or tripping of any interrupting or isolating device shall always be verified, as well as annunciation and target operation.

10.4.2 A transmitter shall ensure that "on potential" checks shall follow all necessary preliminary procedures. The main equipment shall be energized but not placed on load. At its tapped transformer stations, the transmitter shall check all readings of potentials, including determination of correct phasing/phase rotation. The test must also demonstrate that all equipment performs as expected when energized and is in a condition to have primary load applied.

10.4.3 At its tapped transformer stations, a transmitter shall make "On-Load" checks following the application of appropriate load, voltage, current, phase angle or crossed wattmeter readings at the appropriate instrument transformer outputs or protection input points, to ensure that all quantities are appearing as required with respect to magnitude, phase relation, etc. These checks are to determine that relays are properly connected and that the watt and var checks of all indicating and referenced equipment are correct. At times it may be necessary to repeat some or all tests, e.g. relay performance, using load currents.

10.5 FAILURE PROTECTION FOR HIGH-VOLTAGE INTERRUPTING DEVICES

10.5.1 A transmitter shall ensure that protection is provided to trip local and remote breakers if a high voltage interrupting device (HVID) fails to clear a fault properly. The requirements for HVID failure protection vary depending on the maximum permissible fault duration and the location of the connection on the transmission system. Some portions of the transmission system are designed and operated to more stringent requirements to avoid adversely affecting neighbouring transmission systems.

10.5.2 If the IMO or the transmitter so determines, the HVID failure protection shall be achieved by using remote or transfer trip circuits and opening of the motor operated disconnect switch.

10.5.3 In portions of the transmission system having less stringent requirements, the HVID failure protection may be achieved by the opening of the motor-operated disconnect switch. If the disconnect switch experiences a flashover, the line protection at the transmitter's transmission stations shall operate to isolate the fault.

10.5.4 A transmitter shall not use automatic ground switches for any transmitter-owned new installations for triggering line protection operation following the failure of a HVID.

10.5.5 When circuit switchers are used, the interrupter and disconnect switch shall operate independently. Protection systems that trip the interrupter shall simultaneously initiate opening of the disconnect switch.

10.5.6 The direct current voltage supplied to the interrupter and disconnect switch shall be fed from separately fused and monitored direct current supplies: that is, by two direct current cables to the control cabinet.

10.6 INSTRUMENT TRANSFORMERS

10.6.1 A transmitter shall ensure that current transformer output remains within acceptable limits for all anticipated fault currents and for all anticipated burdens connected to the current transformer.

10.6.2 A transmitter shall ensure that current transformers are connected so that adjacent relay protection zones overlap.

10.6.3 A transmitter shall ensure that voltage transformers and potential devices have adequate volt-ampere capacity to supply the connected burden while maintaining their accuracy over the specified primary voltage range.

10.6.4 For each independent protection system, a transmitter shall ensure that separate current and voltage transformer or potential device secondary windings are used, except on low-voltage devices.

10.6.5 A transmitter shall ensure that interconnected current transformer secondary wiring and voltage transformer secondaries are each grounded only at a single point.

10.7 BATTERY BANKS AND DIRECT CURRENT SUPPLY

10.7.1 When station battery banks are used, as a minimum requirement the transmitter shall ensure that if either the battery charger fails or the AC supply source fails, the station battery bank shall have enough capacity to allow the station to operate for at least eight hours.

10.7.2 A transmitter shall ensure that critical direct current supplies, such as relay protection circuits and HVIDs, are monitored and annunciated.

10.7.3 Where the use of a single battery bank is allowed, the transmitter shall ensure that the following conditions are met:

(a) the battery bank can be tested and maintained without removing it from service;
(b) where two separate protective systems are required, each protection system shall be supplied from physically separated and separately fused direct current circuits; and
(c) no single contingency other than failure of the battery bank itself shall prevent successful tripping for a fault.

11. EMBEDDED GENERATION AND BYPASS COMPENSATION

11.1 EMBEDDED GENERATION

11.1.1 A transmitter shall, for all purposes, treat any generation facility that came into service on or before June 8, 2004 as embedded generation in relation to a load, provided that the generation facility was always connected on the customer side of the connection point. This requirement applies regardless of ownership of the generation facility, the voltage at which the generation facility is connected, the location of the generation facility, the size or number of units of generation capacity, or any relationship between the owner of the generation facility and the customer or the load.

11.1.2 A transmitter shall, for all purposes, treat any new generation facility that comes into service after June 8, 2004 as embedded generation in relation to a load, provided that the generation facility is connected on the customer side of the connection point at the time the generation facility comes into service. This requirement applies regardless of ownership of the generation facility, the voltage at which the generation facility is connected, the location of the generation facility, the size or number of units of generation capacity, or any relationship between the owner of the generation facility and the customer or the load.

11.1.3 If at any time after a generation facility comes into service it is reconfigured so as to become connected on the customer side of the point where a load facility is connected to a transmitter's transmission facilities, the transmitter shall not for any purpose treat that generation facility as embedded generation in relation to that load.

11.1.4 If at any time after a generation facility that is connected to a transmitter's transmission system comes into service a load customer disconnects its facilities from the transmitter's transmission facilities and subsequently connects its facilities:

(a) directly to the generation facility; or

(b) to the facilities of another person such that both the load facility and the generation facility are connected to the transmitter's transmission facilities on that person's side of the connection point,

the transmitter shall not for any purpose treat that generation facility as embedded generation in relation to that load facility.

11.2 BYPASS COMPENSATION

11.2.1 A transmitter shall require bypass compensation from a customer if:

(a) the customer disconnects its facility from the transmitter's connection facilities and subsequently connects that facility to a generation facility; and

(b) the transmitter will no longer receive line connection or transformation connection revenues in relation to that facility.

The transmitter shall calculate bypass compensation using the net book value of the transmitter's connection facilities, including a salvage credit and reasonable removal and environmental remediation costs, if applicable.

11.2.2 A transmitter shall not require bypass compensation from a customer for any reduction in a customer's load served by the transmitter's connection facilities that results from renewable embedded generation (determined in accordance with section 11.1), energy conservation, energy efficiency or load management.

12. DISPUTE RESOLUTION

12.1 OBLIGATION TO INCLUDE IN PROCEDURES

12.1.1 Subject to section 12.1.4, a transmitter shall establish a dispute resolution procedure in its connection procedures referred to in section 6.1.4 and shall implement it in the event of a dispute with a customer regarding the transmitter's obligations under the Act, the Electricity Act, its license, this Code or any of the transmitter's connection procedures.

12.1.2 The dispute resolution procedure referred to in section 12.1.1 shall include provisions that:

(a) provide for the fair, timely and effective resolution of disputes;
(b) set out specific timelines for completion of the dispute resolution process; and
(c) establish the right of the transmitter or the customer to bring a dispute to the Board for resolution, if it has not been resolved by the parties within 30 days.

12.1.3 If a dispute arises while a transmitter is constructing new or modified connection facilities for a customer, the transmitter shall not cease work or slow the pace of work without leave of the Board.

12.1.4 The dispute resolution procedure referred to in section 12.1.1 shall not apply to disputes that arise between a transmitter and a customer and that are governed by the dispute resolution process contained in their connection agreement.

13. COMING INTO FORCE

13.0.1 This Code shall be in effect as of the date on which it is published on the Board's website after having been made by the Board, and as of that date replaces the Transmission System Code issued by the Board on July 14, 2000.